To support the regulation of airlines, from an economic viewpoint, it must be demonstrated that less-than-optimum performance would result from a nonregulated industry. The following would occur in a nonregulated environment:

> In low-demand city-pair markets, where traffic is not sufficient for more than one carrier, there will be a tendency toward poorer service (fewer flights) and higher fares, relative to high-demand markets. There is, obviously, always the threat of potential competition if the fares become too high. However, monopolistic profits will be made in this type of market, most of the time.
>
> In high-demand, city-pair markets, the large number of carriers will result in the use of smaller aircraft, with more frequencies than required operating at lower load factors and higher unit costs. This would result in either higher fares or loss to the airline if excess competition and capacity generates fare wars.

In today's environemnt there is a surplus pool of labor, facilities, and used aircraft. This has made it relatively easy for new entrant airlines to begin operations with lower operating costs than existing airlines who are burdened with past labor contracts and debts. New entrants have been able to offer very low fares to gain entrance into new markets.

In the future, the pool of surplus labor, excess facilities, and used aircraft will have disappeared. The ease of entry will vanish. Airlines with strong financial resources will be able to acquire the most efficient aircraft, enter any market, increase flights, lower fares and drive out the competitors that do not have strong financial resources. Elimination of carriers will reduce competition, i.e., reduce the number of carriers per city-pair market and result in increasing fares. There is always the potential threat of competition if fares become excessive relative to other markets. However, the elimination of carriers on a city-pair market may lead the remaining fewer carriers to operate larger aircraft with lower unit costs. This would increase their profits and/or enable them to control market share via pricing. The end result will be an industry dominated by few very large carriers with oligopolistic prices, and numerous smaller specialty or local/regional carriers who have carved out a monopolistic niche for themselves. This process could take five or more years.

While some airlines would be winners, the above process would end up with a less than optimum situation for the nation and most passengers, a difficult situation for airport authorities in planning and financing new airport facilities, and a most difficult period for U.S. aircraft manufacturers in developing and launching new programs. This, in turn, would deter new technology and slow down the long term advancement in air transportation.

The case for/against airline regulation boils down to political issues - ideological as well as practical politics.

The development of the United States transportation system has always been supported by public investment. There has been strong historical support for adequate transportation for all regions of the nation, and for fares being related to distance equally in all parts of the nation. This has been U.S. policy since the Interstate Commerce Act of 1887

One trade-off seems to be a willingness to accept long-term, higher airline fares for less government bureaucracy. Another trade-off relates to who reaps the benefits from improved technology. This is more of a political issue than economic. In the past regulated environment, consumers benefited with an improved product at lower prices. However, organized labor received wages higher than they would have received in alternative uses. This was not due to a scarcity of trained labor resources, but more due to a political environment that was pro-union.

Today, there are both surplus trained resources and a political environment that, if not hostile to unions, is indifferent to them. Thus, real wages will be reduced and become closer to those prevailing in other industries. Benefits will probably be split among the consumers, investors/lenders and, if current trends continue, to the sales distribution systems. The cost of promoting and selling has increased significantly in recent years with the addition of new carriers and the proliferation of fares. This will continue in a nonregulated environment. In recent years travel agents have come to dominate this function. It is no longer stretching the imagination to conceive that the air transportation industry will be dominated by outside marketing organizations who will take for themselves the benefits of future technology, in an increasingly unregulated oligopolistic environment.

THE IMPACT OF DEREGULATION ON AIRPLANE SIZE

C. H. Glenn, Air Canada

Introduction

In the March 1981 edition of Airline Executive, J. S. Murphy, the Editor, in an editorial dealing with Washington International Airport, stated: "What the Federal Aviation Administration, the Congress and the public must understand is that deregulation has changed the role of airports and the United States air transportation is undergoing an equipment revolution that will obsolete the so-called domestic long-range intercontinental airport. The big widebodies that require them will phase out of the picture over the next five to ten years in favor of smaller jets ranging from the 737-300 up to the 767 or A300 Airbus."

What did Murphy mean? Why will there be less need in future for the larger jet when we know from our past experiences that, other factors being equal (i.e., aircraft deployed on the same route networks and developed in the same timeframe from the point of view of technology), small aircraft cost more to operate than larger ones on the basis of cost per available seat mile, they burn more fuel for a given distance per available seat mile, they create more airside delays at airports for a given volume of traffic and they cost more to purchase per installed seat?

In making his statement perhaps Mr. Murphy did not go any deeper than look at the used airplane market today. There are any number of widebodied jets on the market, all sound airplanes, good in fuel consumption and good in operating economics. On the other hand, small aircraft such as the DC-9-30 and the 737-200 are in great demand. Perhaps the answer is deregulation, where more carriers are allowed to compete in the same market for the same traffic - traffic which is not growing and which, because of the large percentage of business travelers is very sensitive to flight frequency. In order to maintain competitive frequencies at economic load factors with more and more carriers competing on the same route, a carrier must resort to smaller aircraft.

Where smaller aircraft are deployed on existing networks it can be assumed that the unit operating costs will be higher, the fuel consumption will be greater and the airport congestion greater. But what if the small aircraft had longer range capabilities than existing small aircraft and an operator elects to overfly a hub and carry passengers non-stop to their destinations rather than have them connect at hubs? Would such an operation be more costly, consume more fuel and create more airport problems than flying in the pre-deregulation hub and spoke networks? This presentation attempts to answer these questions.

Methodology - Production of Operating Plans and Statistics

Because of the lack of suitable data no attempt was made to analyze the total U.S. domestic traffic. This can be left to more enterprising analysts with much larger computers than we use. As we are familiar with our own geography and the characteristics of our own air services, we elected to use our own traffic data as a base.

A hypothetical airline called PARA-AIR was set up to carry all the traffic carried by CP Air, Air Canada and the four regional carriers within Canada. Thirty-one major centers were served with this network. The total traffic carrier in the base year of 1978 accounted for 80 percent of the total intra-Canada traffic, the rest being traffic to the north and within certain provinces. Although the annual traffic flow of about ten million passengers is less than ten percent of that of the U.S. domestic carriers, it is considered to be a large enough sample to reflect the impact of smaller aircraft on the U.S. system although it is apparent that the smallest of the airplanes may be relative.

The statistical base used for the study was taken from Statistical Canada Reports 51-204 and 51-205. These reports cover traffic within Canada and traffic flowing transborder.

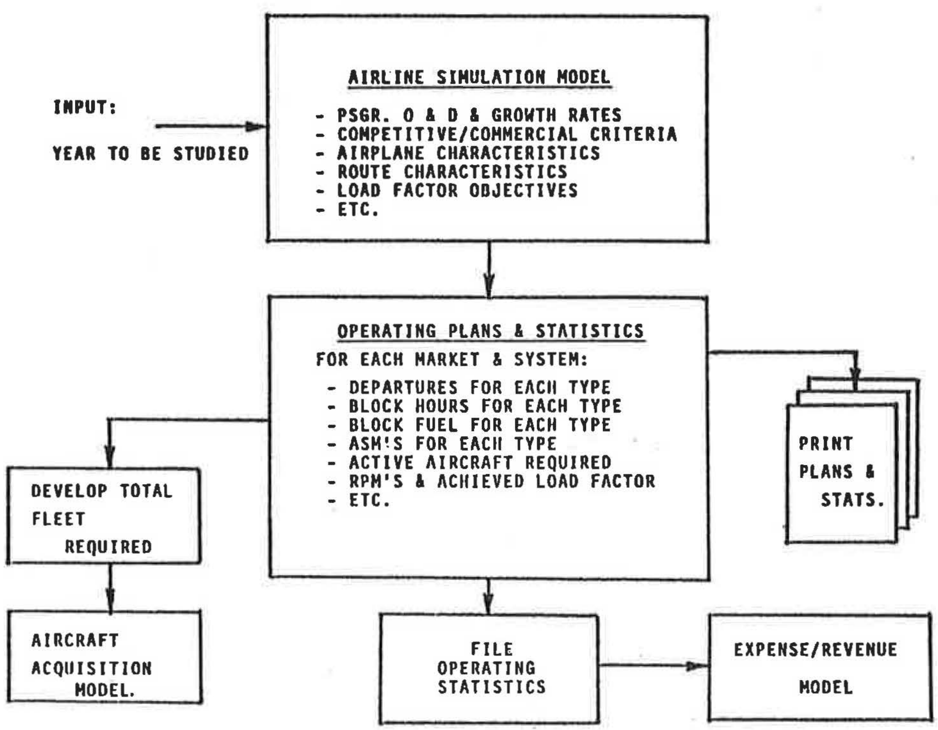
The individual growth rates into the future between the thirty-one Canadian points (120 combinations) have been taken from some slightly out of date Air Canada forecasts and vary considerably across Canada. Western Canada to Central Canada traffic is expected to grow much more rapidly than from Central Canada to Quebec and the Atlantic Provinces. The average system overall growth rates for this study, in terms of revenue passenger miles, is 6.5 percent from 1980 to 1985, and 5.3 percent for 1985 to 1990.

Airline Simulation Model (Figure 1)

An Airline Simulation Model used in Air Canada for the evaluation of fleet alternatives, fuel efficiency studies, station activity, etc., is considered as the only tool currently available which will provide a rapid and accurate testing of the study network against several alternative situations, for several future years.

The Airline Simulation Model is a frequency plan generator/airplane selecting/passenger flowing model designed to duplicate as closely as possible the design of airline patterns as would be done by a professional schedule designer. It is in fact, a network generator. The inputs are:

Figure 1. Airline Simulation Model.



a) Passenger origin and destination forecasts between each pair of points in the system for a base year, and the projected individual growth rates for each pair of points.

b) The candidate aircraft (3 out of a total of 4 to 6, depending on the alternatives) for each flight leg which can be flown.

c) Airplane seating, block time and block fuel characteristics.

d) The target and upper limit load factors for each market area or flight legs.

e) Frequency objectives for each flight leg.

f) Criteria for initiating the first non-stop flight.

g) The desired routing paths for passengers if the volume of traffic is such that no nonstop services can be justified with the smallest candidate aircraft at the lowest planning load factor during the study period.

h) etc.

The model determines when a nonstop flight should start and it endeavors to achieve three frequencies a day between each pair of points, unless a different frequency is specified (as whould be the case where traffic volumes are large). Passengers not carried on nonstop flights are routed through intermediate points, defined in the program.

The output of the model includes the following:

a) For each pair of points, the daily frequency for each type, the passenger load on board and the leg load factor.

b) Weekly departures for each airplane type.

c) Weekly available seat miles for each airplane type.

d) Weekly block hours for each airplane type.

e) The average stage length flown for each type. (Used to calculated airplane daily productivity.)

f) The fuel burned by each airplane type.

g) The size of the fleet for each type. (The number of airplanes may not be integers, as additional non-integer numbers of airplanes may be needed for maintenance and spare coverage. For the financial evaluation, maintenance and operational spare aircraft are added.)

For this particular study Canada has been broken into five separate market areas: Transcontinental, Ontario, Atlantic Provinces, Quebec and the Montreal-Ottawa-Toronto triangle. Each market area has its own overall growth rate and each pair of points within that market has a deviation from the average. Thus, this study has a composite growth rate made up of some 120 different growth rates. Each market and each flight leg can be designed a desired load factor if required.

The calibration patterns flown by the Simulation Model for 1978, the year of the base forecast using current aircraft types, were surprisingly close to those flown on average by Air Canada, CP Air and the four regionals, allowing for differences in equipment types.

Alternatives Tested

The various alternatives tested against the Base Plan are listed in Table 1. In order to minimize the amount of data produced, only one design load factor was used in the simulation.

Average Day and Load Factor Assumptions

For this study an annual average day has been used, which infers that on certain days traffic volumes will be higher and on other days the volumes will be lower. The achieved load factors in the summer would be higher, therefore, from what we would expect for the average annual day. On the basis of an annual average day we have set 75 percent as the upper limit beyond which additional capacity would be added on any particular flight leg. Similarly, the design load factor, which is the objective you wish to achieve and is the "spill" load factor above which passengers are diverted to alternative routings (should alternative routings be available), has been set at 65 percent.

Airplane Types

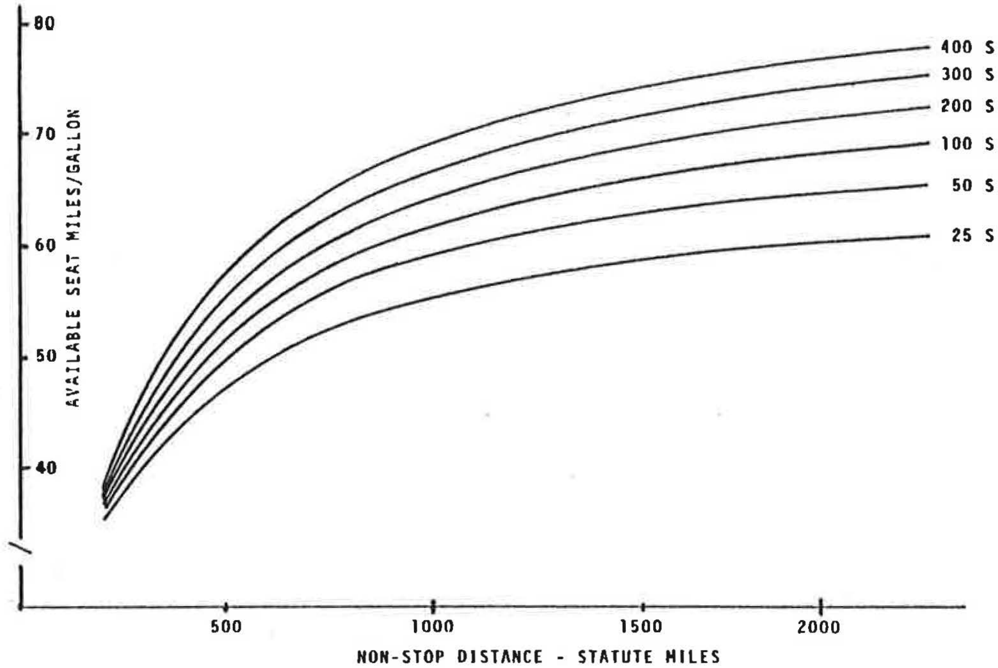
In PARA-AIR only jet airplanes were assumed to be used. The 400 seat jet was assumed to be a scaled down version of the B-747 from the standpoint of

Table 1. Alternatives examined - PARA-AIR.

BASE	-	**400, 300, 200 AND 100 SEAT JET CANDIDATES.**
ALT. #1	-	**400, 300, 200, 100 AND 50 SEAT JET CANDIDATES.**
ALT. #2	-	**400, 300, 200, 100 AND 25 SEAT JET CANDIDATES.**

ALL AIRPLANE SIZES ARE ASSUMED TO HAVE NON-STOP 3000 MILE CAPABILITIES.

Figure 2. Fuel efficiency assumptions, candidate aircraft for PARA-AIR.



fuel consumption and range. The 200 seat jet was assumed to be the B-767, with coast to coast range capabilities, and the 100 set jet some smaller version of the DC-9 which could fly coast to coast. The 25 seat jet was assumed to be similar to the Canadair Challenger, but with a fuselage wide enough to give good four-abreast economy seating for long haul flights. The characteristics of the 50 seat jet were intermediate between those of the 25 seat and the 100 seat jet. The assumed fuel consumption characteristics of the various airplanes are shown in Figure 2.

Methodology - Production of Operating Economics

Unite Cost Data

Using current Air Canada cost information for its existing fleet, the following methodology was used to establish a cost base for PARA-AIR.

1. Determine the unit operating costs per hour or per flight cycle (or per other units) for each airplane type, for the Canadian market areas.
2. Adjust maintenance and other costs if necessary to reflect the changes in airplane gross weights to permit full passenger and baggage operation from coast to coast.
3. Carry out a regression analysis of these costs to determine the unit costs for each of the cost categories for the six airplane sizes used in PARA-AIR. (See typical cost curves in Figures 3, 4 and 5.)
4. Run unit cost program and collect all unit cost data for the base year in the data file.

Aircraft Acquisition Costs

1. Develop PARA-AIR airplane prices using prices based on those being quoted for new types being proposed (Table 2).

Table 2. Base prices assumptions, PARA-AIR aircraft (mid 1980 Canadian $).

400 SEAT	66.3 M
300 SEAT	49.7 M
200 SEAT	33.2 M
100 SEAT	16.6 M
50 SEAT	11.1 M
25 SEAT	6.9 M

ESCALATION RATE OF 12% P.A. TO YEAR AND MONTH OF DELIVERY.

Using an aircraft acquisition model (Figure 6):

2. Determine the progress and final payments for each airplane purchased in the PARA-AIR fleet, including the spares support required and the interest on the pre-delivery payments.
3. Determine the annual depreciation for each type as well as the mid-year book value. Input into the Expense/Revenue Model. (The Expense/Revenue Model uses the book value data and an industry average debt/equity ratio of 60/40, with a 15 percent borrowing rate, to determine the allocated annual interest for each aircraft type.)

Figure 3. Typical cost curves.

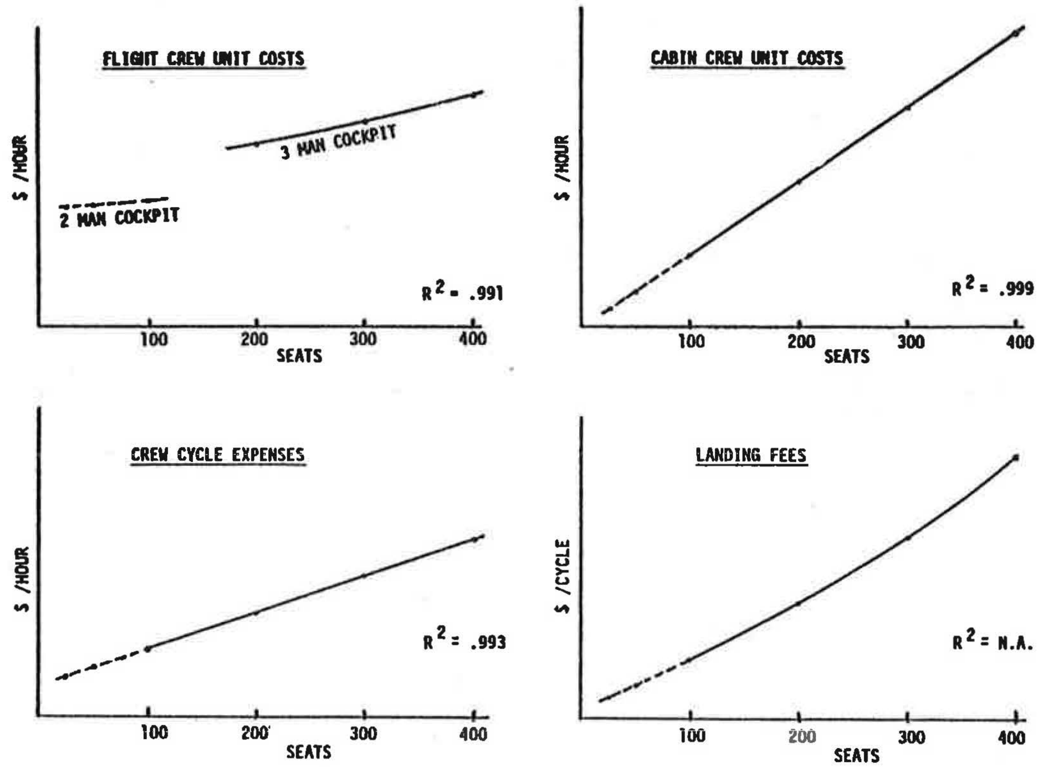


Figure 4. Typical cost curves (continued).

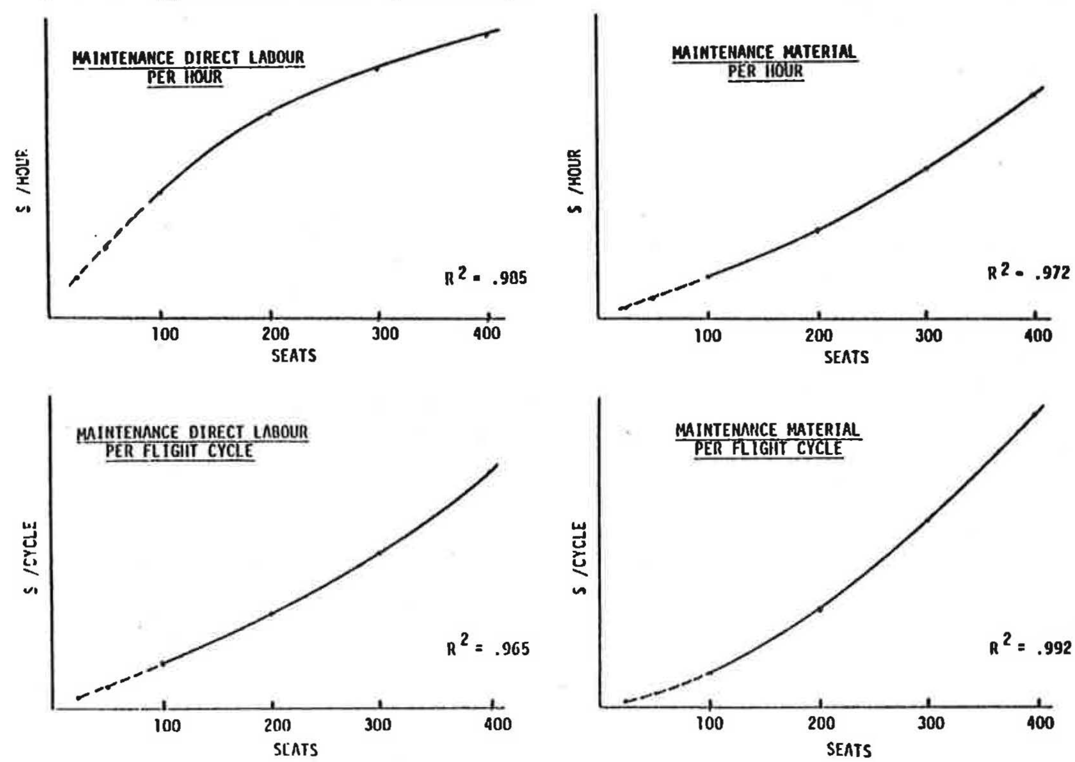


Figure 5. Typical cost curves (continued).

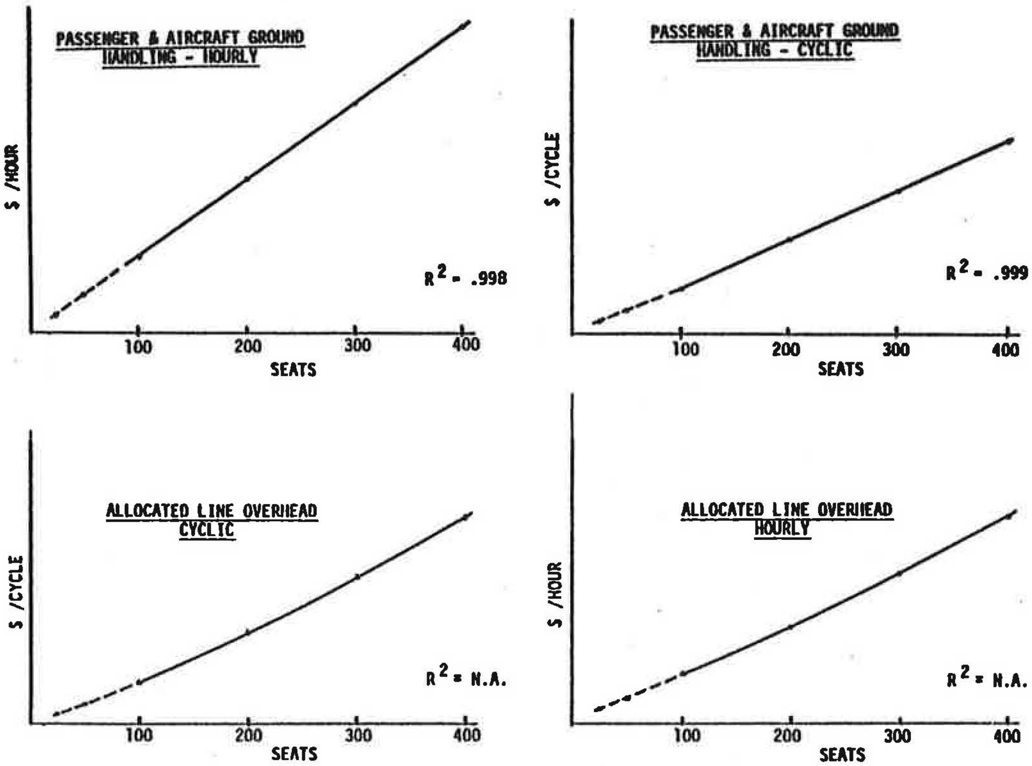


Figure 6. Aircraft acquisition model.

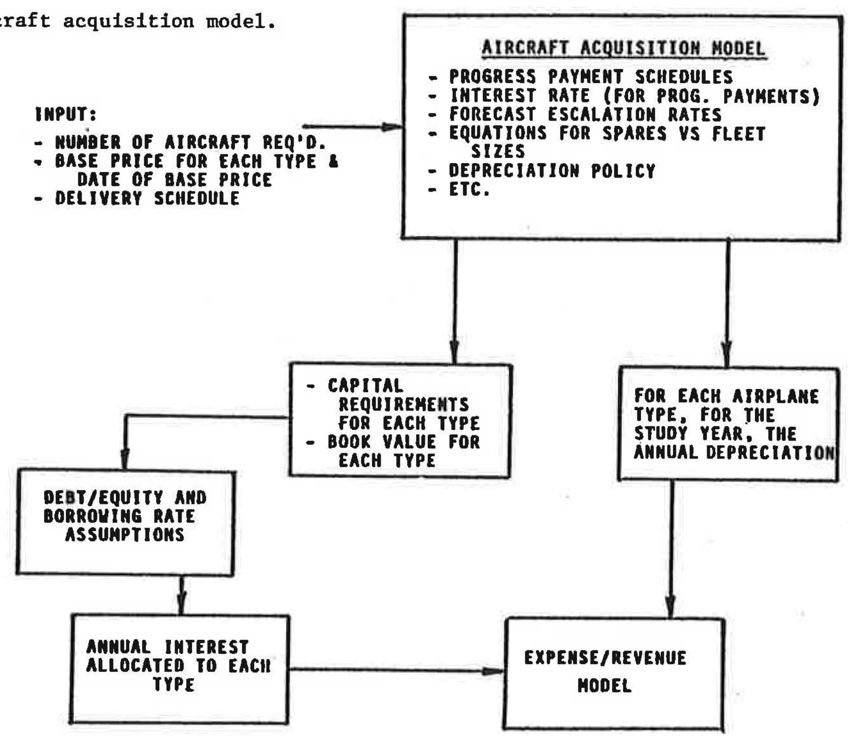
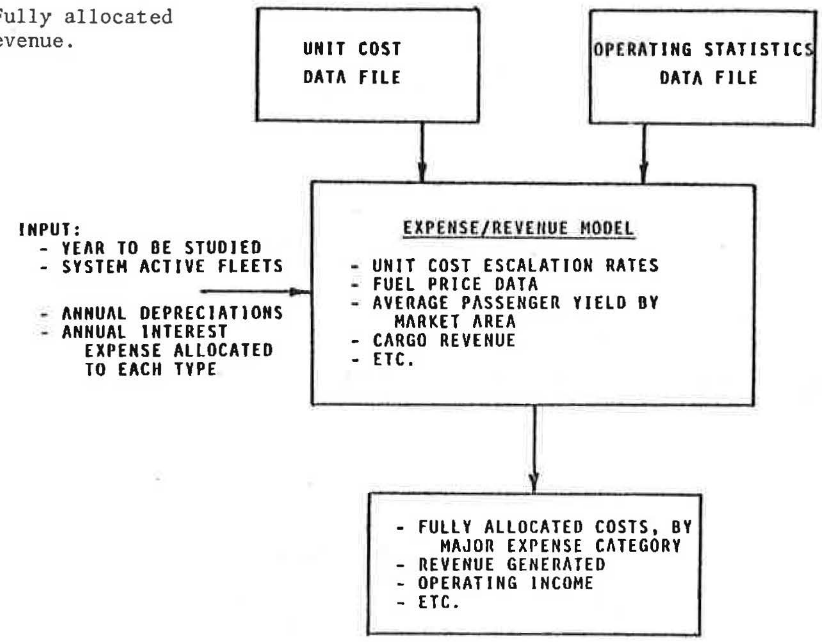


Figure 7. Fully allocated costs and revenue.



Fully Allocated Costs and Revenue (Figure 7)

An "Expense/Revenue" estimating model was used to determine the system operating expenses, operating income (before tax), etc. for PARA-AIR. The model draws unit cost data from the cost file and statistics from the operating statistics file (output from the Airline Simulation Model).

The "Expense/Revenue" estimating model provides for a different escalation rate for each unit cost category and passenger yield for each of the five market areas. The following inputs are made manually:

- Year of the operating plan.
- System active fleet, by type.
- Annual depreciation, by type.
- Average annual book value, by type.

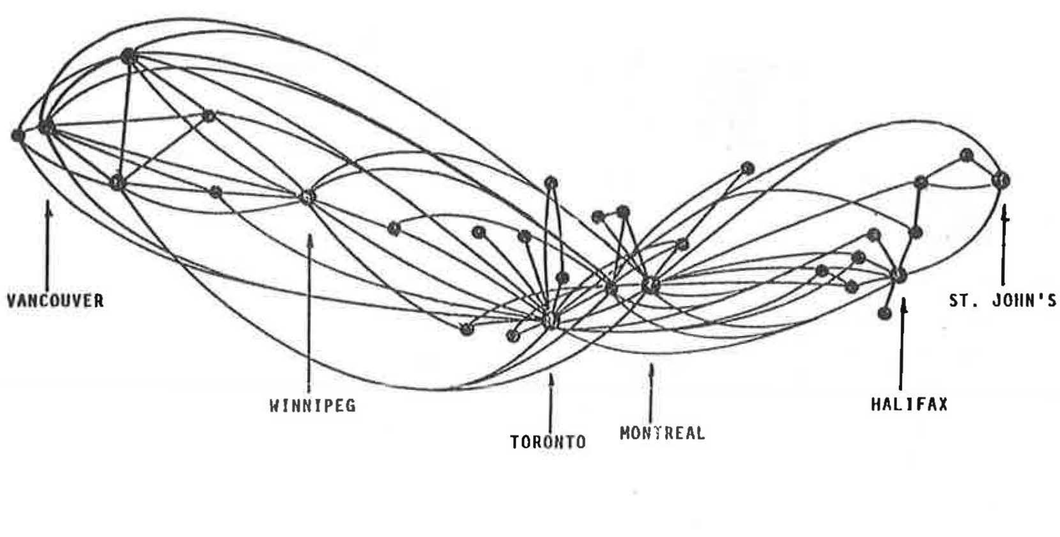
The output includes the fully allocated costs by major expense category, the revenue generated, operating income, etc.

Discussion of Results - Operating Plans (for 1985)

The 400, 300, 200 and 100 seat candidate case is considered as the base as it most closely represents the aircraft sizes flown today by CP Air, Air Canada and the regionals. The basic network generated for this case is shown in Figure 8. There were eighty-seven individual nonstop legs, with two hundred and seventy-seven roundtrips daily.

Figure 9 shows the distribution of aircraft sizes. (The points are the tops of histograns for each airplane size. They are connected in order to display the differences between alternatives in subsequent figures.) Note that only one 400 seat

Figure 8. PARA-AIR route legs flown - 1985, 400, 300, 200 and 100 seat candidate aircraft.



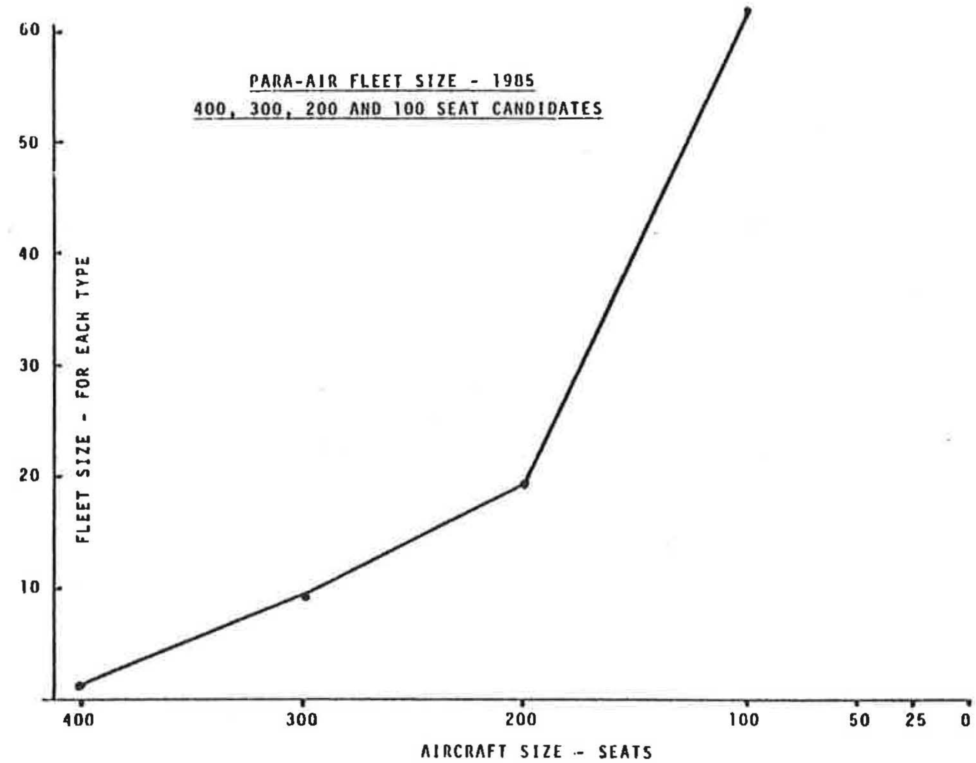


Figure 9. Distribution of aircraft sizes.

aircraft would be required (operating on Vancouver to Toronto). About sixty 100 seat aircraft would be required. The average size airplane in the fleet would have 148 seats (remember that all aircraft including the 100 seat jet are assumed to have Halifax to Vancouver nonstop capabilities).

The distribution of seats by aircraft size is shown in Figure 10. Note that for 1985 more seats would be required with the 100 seat aircraft than with the 400, 300 and 200 seat aircraft. The total seats for all types is 13,290.

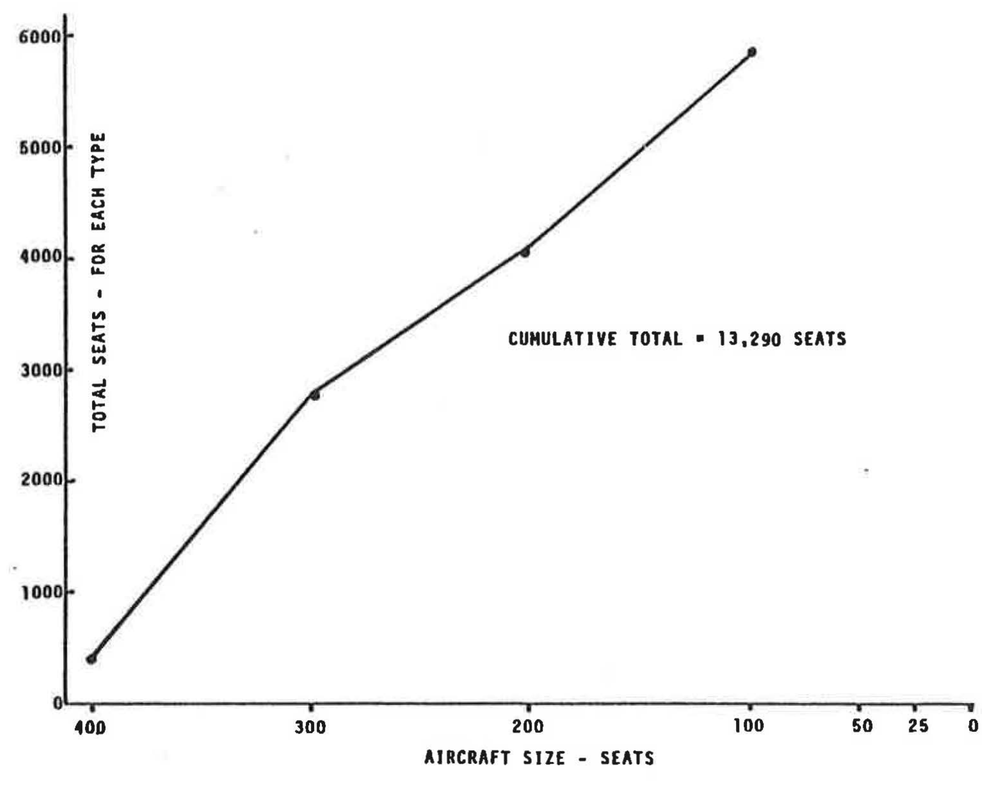


Figure 10. Distribution of seats by aircraft size.

Figure 11. PARA-AIR additional legs flown - 1985, with 50 seat jet added to candidates.

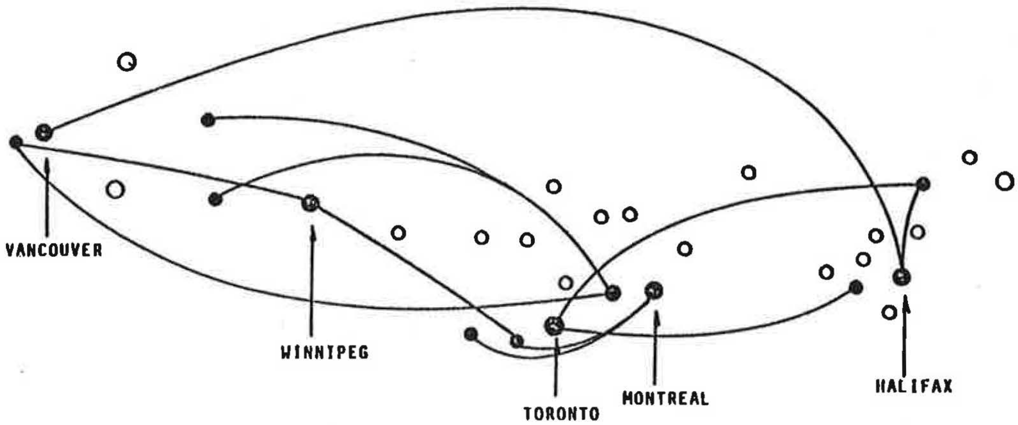


Figure 11 shows the twelve additional nonstop legs which could be flown if a 50 seat long range jet was added to the inventory. These legs are over and above those shown in Figure 8. The total roundtrips per day have increased from 277 to 328. This indicates an improved service to the intra-Canada traveller. (On the basic route network some 50 seat jets are flown, particularly on routes where there would otherwise be a frequency deficiency.)

Figure 12 shows the impact on the fleet of approximately thirty 50 seat jets being added. Note the elimination of the 400 seat airplane, a small reduction in the 300 and 200 seat aircraft and a significant reduction in the 100 seat aircraft.

Figure 13 shows the impact on the distribution of seats of adding 50 seat aircraft. Note (a) the elimination of the 400 seat jet (this will be explained later), (b) that the number of seats required for the 300, 200 and 100 seat aircraft have been reduced, with the greatest reduction coming with the 100 seat aircraft, (c) that the total number of seats required have dropped by 445, indicating a more efficient use of seats. In this fleet the average size of airplane is 117 seats.

Figure 14 illustrates the thirty-one additional nonstop legs which could be flown if a 25 seat long range jet was added to the inventory. These legs are over and above those shown in Figure 8.

Figure 15 shows the impact of adding the 25 seat aircraft to the fleet. Note again the elimination of the 400 seat aircraft and a substantial reduction in the 300, 200 and 100 seat aircraft.

Figure 16 shows the impact of the distribution of seats. Note (a) as with the previous case the

Figure 12. Impact of adding 50 seat jet as candidate, PARA-AIR fleet size - 1985.

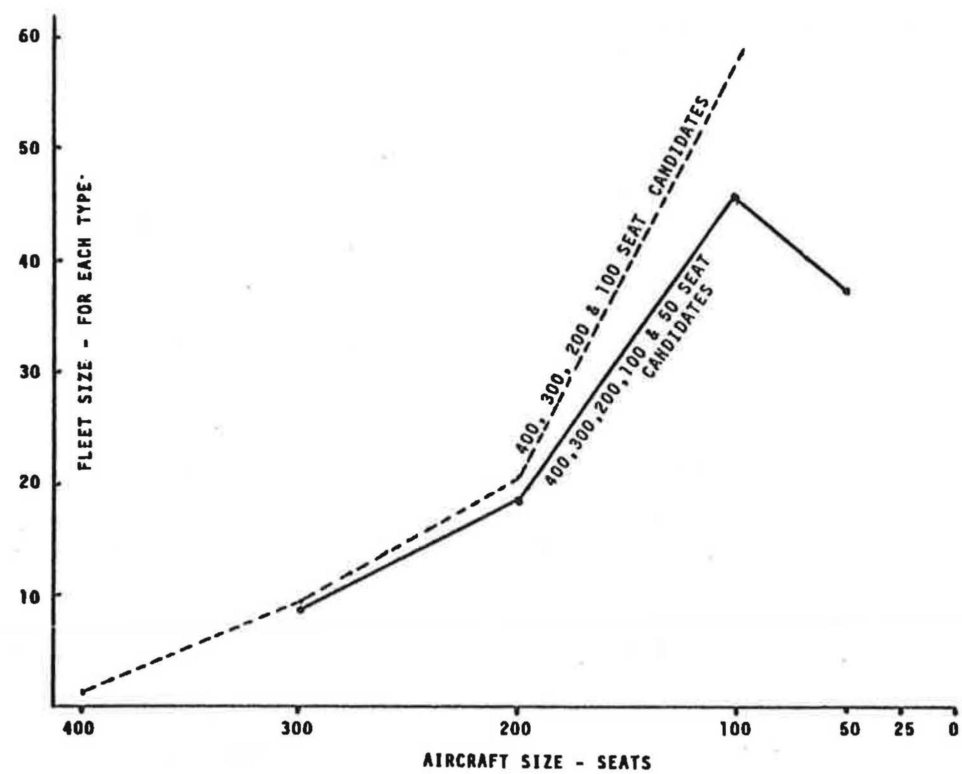


Figure 13. Impact of adding 50 seat jet as candidate, PARA-AIR seats - 1985.

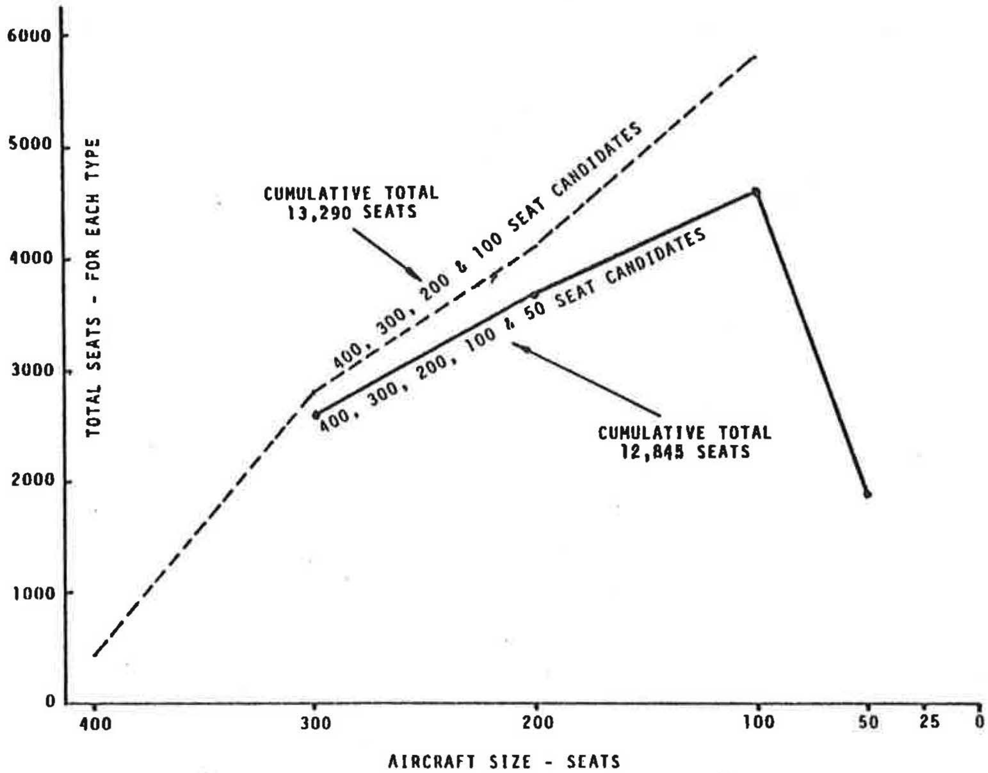


Figure 14. PARA-AIR additional legs flown - 1985, with 25 seat jet added to candidates.

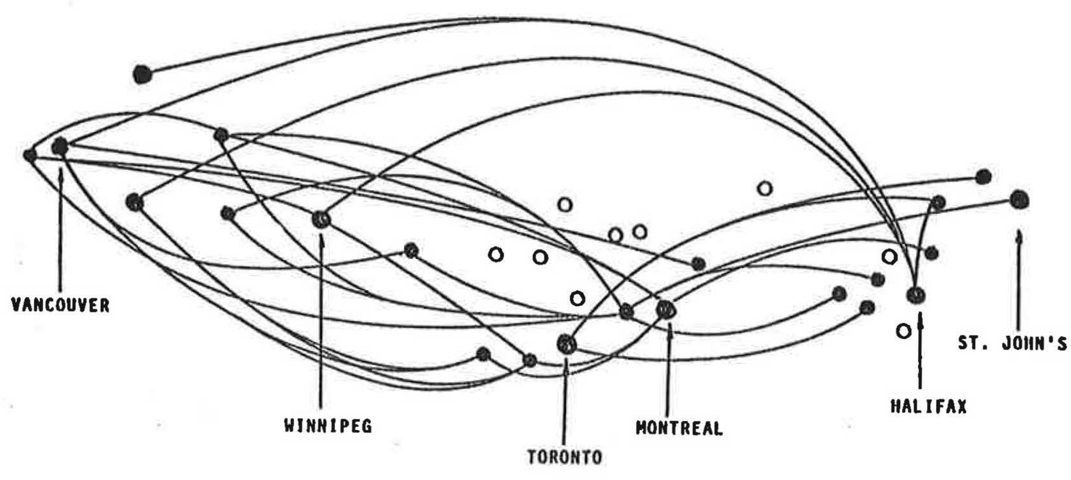
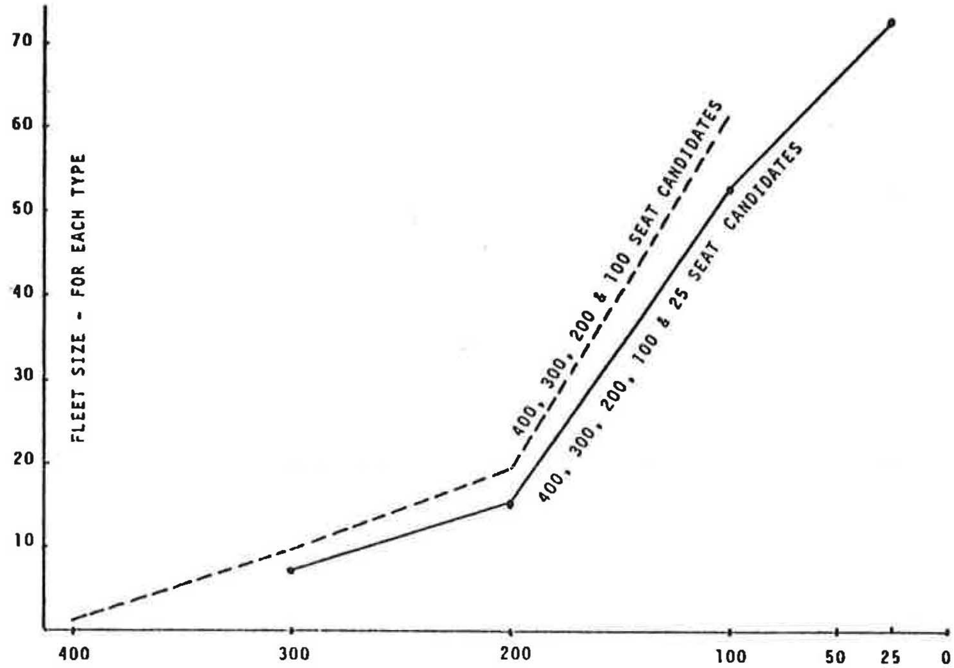


Figure 15. PARA-AIR fleet size - 1985, impact of adding 25 seat jets as candidates.



400 seat aircraft has disappeared, (b) the substantial reduction in the 300 and 200 seat class as well as the 100 seat class, and (c) that the total seats have dropped by 662.

To explain why the addition of the small jets reduces the number of large jets, let us examine Table 3 which shows some examples of the impact on long haul services of the small jets. Note in the base, that is the one using the 400, 300, 200 and 100 seat aircraft, that no nonstop services were flown from Victoria to Montreal and Ottawa, from Vancouver to Halifax and Quebec City, or from Edmonton and Calgary to Halifax.

The impact of the new services with the alternatives which have 50 and 25 seat aircraft as options, causes some significant changes to other routes. In the case of the Victoria to Toronto service, the addition of the small aircraft increases the frequency from one to three. With three frequencies the assumption is made that 100 percent of the local passengers would flow on the nonstop flights. With only one frequency, roughly 70 percent of the

Figure 16. PARA-AIR seats - 1985, impact of adding 25 seat jet as candidate.

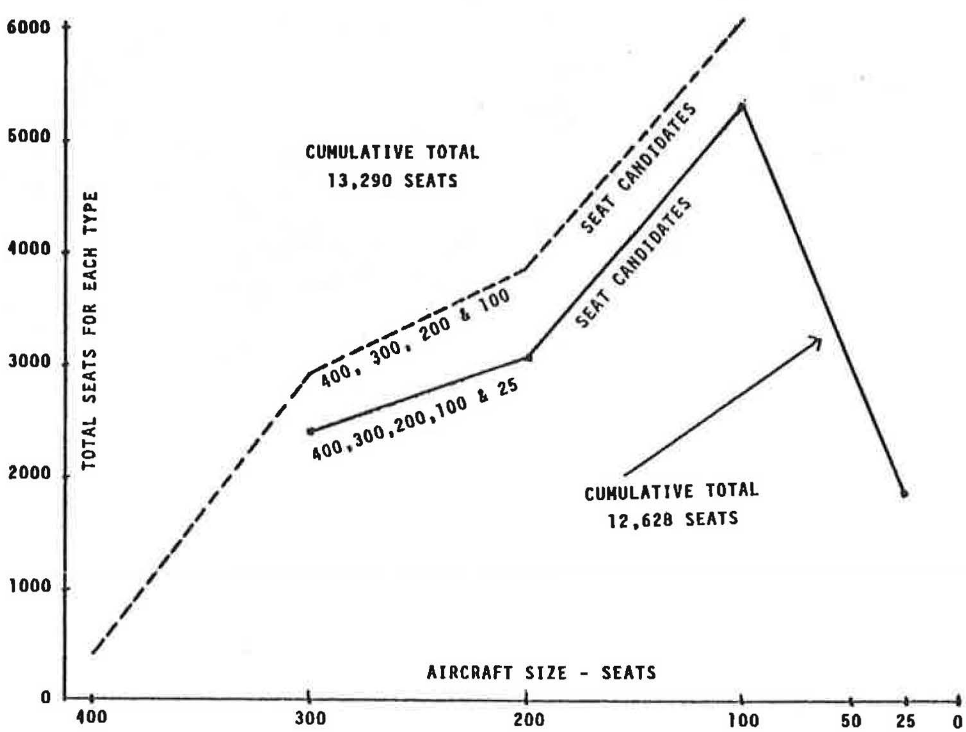


Table 3. Examples of impact of small jets on long haul services.

		400S, 300S 200S & 100S	400S, 300S 200S, 100S & 50S	400S, 300S 200S, 100S & 25S
VICTORIA	- MONTREAL	0	0	2-25S
	- OTTAWA	0	1-50S	2-25S
	- TORONTO	1-100S*	3-50S	1-100S 2-25S
VANCOUVER	- HALIFAX	0	1-50S	3-25S
	- QUEBEC CITY	0	0	1-25S
	- OTTAWA	3-100S	2-100S	2-100S
	- TORONTO	1-400S & 4-300S	5-300S	4-300S & 1-200S
EDMONTON	- HALIFAX	0	1-50S	2-25S
	- TORONTO	4-300S	4-300S	4-300S
CALGARY	- HALIFAX	0	1-50S	3-25S
	- TORONTO	3-300S & 2-200S	3-300S & 2-200S	2-300S & 3-200S

*ONE DAILY ROUNDTRIP OF 100 SEAT JET

passengers would flow on the nonstop flights, with the rest going via Vancouver.

A significant change takes place on the Vancouver to Toronto route. Because of the loss of traffic due to the nonstop flights out of Victoria and Vancouver to points beyond, the 400 seat flight is eliminated and replaced by smaller types. Similarly, whereas the frequency from Edmonton and Calgary to Toronto remains the same the aircraft sizes have been adjusted downwards.

The summary of some of the statistics for PARA-AIR for 1985 is shown in Figure 17. Note the gradual increase in achieved load factor as the average size of airplane decreases.

Note also that in spite of the poor fuel consumption characteristics of the small jets, there is little difference in overall consumption. This is due to the longer average stage lengths and the higher average load factor which results from the smaller average aircraft size.

Airport Congestion

In Alternative Number 2 the number of passengers departing from Toronto Airport were about 8 percent lower than in the base case. This resulted from a considerable number of passengers overflying Toronto to their ultimate destination. Airside activity (airplane departures) was virtually unchanged, although the average size of airplane departing Malton was smaller than in the base case. This would lead to the conclusion that the noise at Malton made by aircraft flying the Canadian network of PARA-AIR would be less under the alternatives with smaller aircraft, than with the base case. (Under any of the United States, Canadian or international noise requirements, large aircraft are allowed to generate higher noise levels than smaller types.)

In the PARA-AIR type of operation, small airplanes, therefore, do not create airside congestion but would actually reduce terminal congestion at major hubs.

Discussion of Results - Operating Economics

A summary of the expenses for the base case (400, 300, 200 and 100 seat airplanes) plus the two alternatives, is shown in Figure 18. Note the narrow spread (1.5 percent) in the total of the operating expenses, although there appears to be a fairly wide spread between individual expense elements. The narrow spread reflects the fact that a large percentage of airline operating expenses are not related to the actual expense of operating the airplanes.

Figure 17. Summary - PARA-AIR, 1985.

	CANDIDATE AIRCRAFT		
	BASE	ALT. #1	ALT. #2
	400, 300, 200, 100	400, 300, 200, 100, +50	400, 300, 200, 100, +25
NON-STOP LEGS	87	99	118
ROUNDTRIP PER AVERAGE DAY	277	328	440
AV. SEAT STAGE LENGTH (MILES)	670	703	718
INSTALLED SEATS	13,290	12,845	12,628
AV. SIZE OF AIRCRAFT (SEATS)	148	117	84
ACHIEVED LOAD FACTOR - %	63.4	64.0	64.2
ANNUAL BLOCK FUEL (MIL. GALS)	315.3	310.5	312.6

Figure 18. Expense summary for average week - 1985 (current dollars 000s).

	BASE	ALT. #1	ALT. #2
	400,300,200,100	400,300,200,100 +50	400,300,200,100 +25
DIRECT LABOUR	11,421.6	11,496.6	12,453.3
MATERIAL	2,422.8	2,245.4	2,154.8
FUEL	11,594.3	11,419.0	11,494.4
PSGR. FOOD & INSURANCE	2,180.2	2,180.2	2,180.2
LANDING FEES	2,111.8	1,999.5	1,996.7
DEPRECIATION	4,507.7	4,511.5	4,532.7
INTEREST & INSURANCE	5,590.8	5,549.3	5,601.4
PSGR. COMMISSIONS	2,915.5	2,915.5	2,915.5
ALLOCATED LINE OVERHEADS	8,655.2	8,296.1	8,150.7
H.Q. OVERHEAD	4,930.2	4,930.2	4,930.2
TOTAL	56,330.1	55,543.3	56,409.9

Relative to the base case, the total expense of operating the cockpit crew increases by 44 percent in Atlernative Number 2 over the base case (values not shown in summary). Part of this increase is compensated by the lower ground cost resulting from the higher network efficiency of Alternative Number 2. The net is still an increase of 9 percent in total direct labor (a lower percentage when indirect labor is included).

Material is slightly lower for the alternatives using the smaller aircraft, reflecting the fewer seat departures and, theoretically, the lower material costs for the lower by-pass engine used in the smaller airplanes.

The relatively minor difference in fuel expenses reflects the combination effects of load factor and more direct passenger (seat) routings. If the various sized airplanes had fuel characteristics different from the assumed characteristics, the expense values would be different. Hopefully new smaller airplane types would be more efficient than those assumed in this study.

The ownership expenses vary by 4.7 percent, reflecting the higher price per seat assumed for the smaller types. The 50 seat airplane was assumed to cost about one-third more per seat than the 400, 300, 200 and 100 seat airplanes, and the 25 seat airplane two-thirds more. Had the price assumptions for the larger types been on the basis of the cost of developing and producing rather than on the "market" price, the ownership differential between the alternatives would have been narrower.

The spread in the allocated line overheads reflects the impact of load factor and network efficiency, plus inventory processing expenses, which are directly related to material expenses.

On the basis of the revenue assumptions, the operating income, for one week in 1985, would be as shown in Table 4. Because operating income is the difference between expense and revenue, the leverage of the lower expenses for Alternative Number 1 becomes apparent. It would appear, based on all the assumptions of airplane characteristics and unit cost characteristics, that from the economic viewpoint, there is an optimum size for the small airplane in the fleet, somewhere between 100 and 25 seats. It may not be 50. It could be 40 or 60 or some other number for Canada; perhaps somewhat larger for the United States. Further work based on more realistic assumptions would be necessary to determine the optimum.

But what if a small airplane fleet was operated separately from the large ones - in competition perhaps? Table 5 isolates the expenses associated with the 50 seat jet transport (the best financial results). Note that the removal of much of the non-local traffic makes the remainder of the fleet more profitable while the 50 seat fleet operates at a loss.

Does this mean that a fleet of small aircraft operating long haul routes would be unprofitable? Not necessarily. There are other advantages of small airplanes as shown in Table 6, which have not been built into the assumptions. With present day

Table 4. Expense/revenue comparisons (1985, 000 $/week).

	BASE	ALT. #1	ALT. #2
	400,300,200,100	400,300,200,100 +50	400,300,200,100 +25
TOTAL EXPENSE	56,330.1	55,543.3	56,409.9
REVENUE	59,520.8	59,520.8	59,520.8
OPERATING INCOME	3,190.7	3,977.5	3,110.9
OP. INCOME-% REV.	5.4	6.7	5.2

Table 5. Expense/Revenue comparison - Alternative Number 1 (+50 Seat Jet) (1985, 000 $/week).

	BASE	ALT. #1	ALT. #1 BREAKDOWN		50 SEAT SEPARATE AIRLINE	
	400,300 200,100	400,300 200,100 +50	400,300 200,100	50	*	**
DIR. LABOUR	11,421.6	11,496.6	9,363.9	2,132.7	2,132.7	1,919.4
FUEL	11,594.3	11,419.0	9,742.5	1,676.5	1,676.5	1,676.5
OWNERSHIP	10,098.5	10,060.8	7,683.8	2,377.0	2,377.0	2,377.0
OTHER	23,215.9	22,566.9	19,362.2	3,204.7	3,204.7	3,011.0
TOTAL EXP.	56,330.1	55,543.3	46,152.4	9,390.9	9,390.9	8,983.9
REVENUE	59,520.8	59,520.8	51,134.3	8,386.5	9,957.4	9,957.4
OP. INCOME	3,190.7	3,977.5	4,981.9	-1,004.4	566.5	973.5
OP.INC.% REV.	5.4	6.7	9.7	-12.0	5.7	9.8

*ASSUMES NO PROMOTIONAL ECONOMY FARES.

**ASSUMES 10% LOWER LABOUR RATES AND NO PROMOTIONAL ECCONOMY FARES.

Table 6. Other advantages of small airplanes.

OTHER FACTORS BEING EQUAL, SMALL JET TRANSPORTS, RELATIVE TO LARGE JET TRANSPORTS:

1. PERMIT NEW NON-STOP SERVICES TO BE INAUGURATED SOONER, THUS STIMULATING THE MARKET.
2. BECAUSE OF HIGHER FREQUENCY, WOULD ATTRACT A LARGER SHARE OF THE MARKET.
3. ALLOW BETTER MATCHING OF CAPACITY TO DEMAND VARIATIONS (SEASONAL AND DAY OF WEEK).
4. ACHIEVE HIGHER AVERAGE LOAD FACTORS IN GROWING MARKETS.

average economy fares in Canada being some 20 percent lower than regular economy fares, a small jet airline, if it provided adequate frequency and catered to the business class of traffic, could discourage promotional fares and ask only the regular economy fares. The impact of this is also shown in Table 5, as well as the impact of paying lower labor rates (which may be a valid assumption for a growing local service carrier).

Some of the objectives of a small jet airline are shown in Table 7.

Table 7. Some objectives of a "small jet" airline.

1. NOT TO OPERATE SHORT HAUL ROUTES.
2. TO OVERFLY MAIN HUBS (STAY OUT OF HUBS AS MUCH AS POSSIBLE).
3. NOT TO OPERATE ROUTES WHERE TRAFFIC VOLUMES CAN SUPPORT LARGER TYPES.
4. TO OPERATE ON ROUTES WHERE INTERLINE OR CONNECTING TRAFFIC IS AT A MINIMUM.
5. TO CATER TO BUSINESS MARKETS, OR MARKETS WITH FLAT SEASONAL CHARACTERISTICS.
6. NOT TO COMPETE DIRECTLY WITH TRUNK CARRIERS AND MINIMIZE THE USE OF NON-COMPENSATORY FARES.

Conclusion

In a deregulated environment there is a place for a small, long-range jet. The Canadian market may not be large enough to justify the development of such an airplane; however, the United States market is over ten times the size, and there must be many pairs of points which could justify nonstop service if a small jet transport was available. More work is required to determine the optimum size for the United States market. In any event, for areas where the route networks are not rigid, the small airplane should have relatively long-range capabilities.